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EXAMINER

JAKOVAC, RYAN J

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/782,314

Applicant(s)

SMITH ET AL.

Examiner

RYAN J. JAKOVAC

Art Unit

2145

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-67 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-67 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/550E)
Paper No(s)/Mail Date 9/03/04, 9/03/04, 7/05/05, 4/13/07 and 4/16/08
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

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DETAILED ACTION

Claims 1-67 are pending.

Claims 1-67 are rejected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-20, 22-31, 33-38, 40-48, 50-58, and 60-67 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. 2001/0014097 to Beck et al (hereinafter Beck).

Regarding claim 1, Beck teaches a system comprising: a virtual link bundle comprising a plurality of communication links, wherein a first end of each of the communication links is configured to be coupled to a first network device (Fig. 2, Processor node A is a component of the cluster connected to subnet S1. The communications links including the links between the processor nodes of the cluster and the network subnet are shown in Fig. 2.); a second end of each of a first one of the communication links is configured to be coupled to a first virtual network device sub-unit within a virtual network device (Fig. 2 discloses Processor node B (i.e. first virtual network device sub-unit) which is a node inside the cluster (i.e. virtual network device). The communications links are shown connected via the subnet s1 between the network router and the processor nodes.); and a second end of each of a second one of the communication links is configured to be coupled to a second virtual network device sub-unit within the virtual network device (Fig. 2 discloses Processor node C (i.e. second virtual network device sub-unit) which is a node inside the cluster (i.e. virtual network device). The communications links are shown connected via the subnet s1 between the network router and the processor nodes.).

Regarding claim 2, Beck teaches the system of claim 1, further comprising the first network device, wherein the first network device is configured to select a communication link of the plurality of communication links on which to send a particular packet (Paragraph [0009], A data packet is broadcast to the network for delivery to a particular node (i.e. along a particular link to the node)).

Regarding claim 3, Beck teaches the system of claim 2, wherein each packet sent between the virtual network device and the first network device is sent via only a one of the communication links (Paragraph [0030], A destination address is specified for a particular node, thus packets are sent via the specific link associated with an individual processor.).

Regarding claim 4, Beck teaches the system of claim 2, wherein the first network device comprises a plurality of ports, each of the ports configured to communicate packets with a respective client (Paragraph [0040], Nodes listen for packets associated with a particular client port number.), the first network device is configured to append a header to a packet before sending the packet to the virtual network device via one of the communication links, the header identifies a one of the ports having received the packet (Paragraph [0009], The data packet's header is modified before it is delivered across the network to the processor node.).

Regarding claim 5, Beck teaches the system of claim 1, further comprising the first virtual network device sub-unit, wherein the first virtual network device sub-unit is configured to identify whether a one of the communication links is coupled to another virtual network device sub-unit within the virtual network device (Paragraph [0011], When a link has failed, the address of the processor node is acquired by another processor node for the duration of the failure.).

Regarding claim 6, Beck teaches the system of claim 1, further comprising the first virtual network device sub-unit (Fig. 2, Processor node B) and the second virtual network device sub-unit (Fig. 2, processor node C), wherein the first virtual network device sub-unit and the second virtual network device sub-unit are configured to

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communicate packets with each other via a virtual network device link (Paragraph [0027], Processor nodes distribute packets within the cluster.).

Regarding claim 7, Beck teaches the system of claim 1, wherein the communication links are configured to be managed as a single link (Paragraph [0004], Cluster alias addresses are used to make the cluster appear to be a single node.).

Regarding claim 8, Beck teaches a system comprising: a first virtual network device sub-unit (Fig. 2, Processor Node A) comprising: a first interface (Fig. 2, Processor interface 20a.); and a controller coupled to the first interface and configured to forward packets received via the first interface (Paragraph [0027], The processor node distributes packets to other nodes within the cluster.), wherein the first interface is identified by a first logical identifier, a second interface is identified by the first logical identifier (Fig. 2, Interfaces are associated with an IP address.), an interface bundle comprises the first interface and the second interface (Fig. 2 discloses a grouping of processor nodes called a cluster with interconnected communication links.), and the second interface is comprised in a second virtual network device sub-unit (see also paragraph [0027]).

Regarding claim 9, Beck teaches the system of claim 8, further comprising the second virtual network device sub-unit (Fig. 2 discloses a system including multiple processor nodes (i.e. second virtual network device sub-unit.).

Regarding claim 10, Beck teaches the system of claim 9, wherein the first virtual network device sub-unit is configured to maintain consistent forwarding information with the second virtual network device sub-unit (Paragraph [0027], The processor node distributes packets to other nodes within the cluster.).

Regarding claim 11, Beck teaches the system of claim 10, wherein the controller is configured to perform control protocol processing for the first interface according to a routing protocol running on the interface bundle (Paragraph [0076], Nodes in the cluster establish databases containing the network layer addresses used by each

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processor node in the cluster.), the controller is configured to provide information generated when performing the control protocol processing to a secondary controller comprised in the second virtual network device sub-unit (Paragraph [0053-0054], The Mbuf chain data structure is sent across a cluster interconnect to a processor node.), and the secondary controller is configured to use the information to manage the second interface (Paragraph [0055], The Mbuf chain is queued for service of packets on the second node.).

Regarding claim 12, Beck teaches the system of claim 8, wherein the controller is configured to lookup a destination address of a packet in a lookup table (Paragraph [0040-0041], The receiver listens on a destination port number. The processor node looks up receiver applications in a lookup table.), and if the lookup table returns the first logical identifier, the first virtual network device sub-unit is configured to prioritize sending the packet via the first interface over sending the packet via the second interface (Paragraph [0041-0044], A database is maintained from which a node is selected based on selection weights which include IP address (i.e. logical identifier)).

Regarding claim 13, Beck teaches the system of claim 12, wherein if the lookup table returns the first logical identifier, the first virtual network device sub-unit is configured to send the packet via the first interface instead of sending the packet via the second interface, unless one or more of the first interface and a link coupled to the first interface are failed (Paragraph [0076], Nodes in the cluster establish databases containing the network layer addresses used by each processor node in the cluster. If the processor node crashes, another node takes over.).

Regarding claim 14, Beck teaches the system of claim 13, wherein the first virtual network device sub-unit comprises a plurality of interfaces, more than one of the interfaces are each comprised in the interface bundle, and the more than one of the interfaces comprises the first interface (Paragraph [0062], Each node may contain more than one interface. Fig. 7 discloses nodes having multiple interfaces. Nodes with multiple interfaces are comprised in the cluster (i.e. interface bundle)).

Regarding claim 15, Beck teaches the system of claim 14, wherein if each respective communication link coupled to the more than one of the interfaces fails, the first virtual network device sub-unit is configured to forward

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the packet via the second interface comprised in the second virtual network device sub-unit (Paragraph [0076],

Nodes in the cluster establish databases containing the network layer addresses used by each processor node in the cluster. If the processor node crashes, another node takes over.).

Regarding claim 16, Beck teaches the system of claim 8, wherein the first virtual network device sub-unit (Fig. 2, Processor Node A) is coupled to the second virtual network device sub-unit by a virtual network device link (Fig. 2 discloses the network links between the processors in the cluster including the network subnet.).

Regarding claim 17, Beck teaches the system of claim 16, wherein the first virtual network device sub-unit is configured to learn that a source address of the second packet is behind the first interface, in response to receiving a second packet via the virtual network device link (Paragraph [0009], The packet is broadcasted from one node to another over the network.).

Regarding claim 18, Beck teaches the system of claim 16, wherein the first interface is configured to filter the second packet from a packet flow being sent via the first interface if the second packet was received via the virtual network device link (Paragraph [0009], When a receiving node determines which processor node to send to, it broadcasts the data packet over the network for delivery to the processor node.).

Regarding claim 19, Beck teaches a system comprising: a virtual link bundle (Fig. 2 discloses subnet S1 connected to processor nodes of a cluster. The subnet and the connections to the processor nodes comprise the virtual link bundle.); a first virtual network device sub-unit (Fig. 2, Processor node B); and a second virtual network device sub-unit (Fig. 2, Processor node C), wherein a first interface of the first virtual network device sub-unit is coupled to the virtual link bundle (Fig. 2, Processor node B has an processor interface 20b which is connected to the subnet.), a second interface of the second virtual network device sub-unit is coupled to the virtual link bundle (Fig. 2, Processor node C has an processor interface 20C which is connected to the subnet.), and each of the first interface and the second interface is identified by a first logical identifier (Fig. 2, The interfaces are identified by IP address, specified in the figure as S1.B and S1.C.).

Regarding claim 20, Beck teaches the system of claim 19, further comprising: a network device coupled to the first virtual network device sub-unit and the second virtual network device sub-unit by the virtual link bundle (Fig. 2 discloses a node (i.e. network device) connected to the processor nodes (i.e. first and second virtual network devices.).

Regarding claim 22, Beck teaches the system of claim 19, wherein a primary controller comprised in the first virtual network device sub-unit is configured to perform control protocol processing for the first interface according to a routing protocol running on the virtual link bundle (Paragraph [0007], Nodes distribute TCP packets to other processing nodes for servicing.), the primary controller is configured to send information generated by performing the control protocol processing to a secondary controller comprised in the second virtual network device sub-unit, and the secondary controller is configured to use the information to manage the second interface (Paragraph [0055], The Mbuf chain is sent to a node from a second node and queued for service on the second node.).

Regarding claim 23, Beck teaches the system of claim 19, wherein the first virtual network device sub-unit is configured to lookup a destination address of a packet in a lookup table (Paragraph [0041], The node accesses a lookup table in accordance with which port and a node (i.e. destination address) is listening on for incoming packets.), and if the lookup table returns the first logical identifier, the first virtual network device sub-unit is configured to prioritize sending the packet via the first interface over sending the packet via the second interface (Paragraph [0076], Nodes in the cluster establish databases containing the network layer addresses used by each processor node in the cluster. If the processor node crashes, another node takes over.).

Regarding claim 24, Beck teaches the system of claim 23, wherein each of a plurality of interfaces comprised in the first virtual network device sub-unit is coupled to a respective communication link comprised in the virtual link bundle, and the interfaces comprise the first interface (Paragraph [0062], Each node may contain

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more than one interface. Fig. 7 discloses nodes having multiple interfaces. Nodes with multiple interfaces are comprised in the cluster (i.e. interface bundle).).

Regarding claim 25, Beck teaches the system of claim 24, wherein if each respective communication link coupled to the interfaces fails, the first virtual network device sub-unit is configured to send the packet via the second interface comprised in the second virtual network device sub-unit (Paragraph [0076], Nodes in the cluster establish databases containing the network layer addresses used by each processor node in the cluster. If the processor node crashes, another node takes over.).

Regarding claim 26, Beck teaches the system of claim 23, wherein the first virtual network device sub-unit (Fig. 2, Processor Node A) is coupled to the second virtual network device sub-unit by a virtual network device link (Fig. 2 discloses the network links between the processors in the cluster including the network subnet.).

Regarding claim 27, Beck teaches the system of claim 26, wherein the first network device is configured to learn that a source address of a packet is behind the first interface, in response to receiving the packet via the virtual network device link (Paragraph [0009], The packet is broadcasted from one node to another over the network.).

Regarding claim 28, Beck teaches the system of claim 26, wherein the first interface is configured to filter a second packet from a packet flow being sent via the first interface if the second packet was received via the virtual network device link (Paragraph [0009], When a receiving node determines which processor node to send to, it broadcasts the data packet over the network for delivery to the processor node.).

Regarding claim 29, Beck teaches a method comprising: assigning a first logical identifier to each interface included within an interface bundle (Fig. 2 discloses a system comprising a cluster of nodes (i.e. interface bundle) where each node is assigned an IP address (i.e. logical identifier).) wherein the interface bundle comprises a first interface of a first virtual network device sub-unit (Fig. 2, Processor node B has a processor interface 20b.) and a second interface of second virtual network device sub-unit (Fig. 2, Processor node C has a processor interface 20c.);

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coupling a first end of a first link to the first interface, the first link comprised within a virtual link bundle; and coupling a first end of second link to the second interface, the second link comprised within the virtual link bundle (Fig. 2 discloses communication links connecting all the processors in the cluster with individual links to each processor via a subnet.).

Regarding claim 30, Beck teaches the method of claim 29, further comprising: coupling a second end of the first link to a third network device; and coupling a second end of the second link to the third network device (Fig. 2 discloses communication links connecting all the processors in the cluster with individual links to each processor via a subnet.).

Regarding claim 31, Beck teaches the method of claim 30, further comprising: selecting one of the first link and the second link on which to send a packet from the third network device (Paragraph [0009], When a receiving node determines which processor node to send to, it broadcasts the data packet over the network for delivery to the processor node.).

Regarding claim 33, Beck teaches the method of claim 31, wherein each packet sent between the third network device and a virtual network device is sent via one, but not both, of the first link and the second link (Paragraph [0009], When a receiving node determines which processor node to send to, it broadcasts the data packet over the network for delivery to the processor node.), and the virtual network device comprises the first virtual network device sub-unit and the second virtual network device sub-unit (Fig. 2 discloses a cluster containing processor nodes B (first virtual network sub-unit) and C (second virtual network device sub-unit)).

Regarding claim 34, Beck teaches the method of claim 33, further comprising: appending a header to a packet (Paragraph [0009], A data packet is broadcast to the network for delivery to a particular node (i.e. along a particular link to the node)); and sending the packet and the header from the third network device to the virtual network device via the virtual link bundle (Paragraph [0009], When a receiving node determines which processor node to send to, it broadcasts the data packet over the network for delivery to the processor node.), wherein the third

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network device comprises a plurality of ports, each of the ports configured to communicate packets with a respective client (Paragraph [0040], Nodes listen for packets associated with a particular client port number.), and the header identifies which one of the ports received the packet (Paragraph [0030], The TCP/IP header identifies the source node, the destination node, the sending port, the destination port, and the protocol being used.).

Regarding claim 35, Beck teaches the method of claim 29, further comprising: identifying whether any of the links comprised in the virtual link bundle are anchored to different virtual network device sub-units within the virtual network device (Paragraph [0011], When a link has failed, the address of the processor node is acquired by another processor node for the duration of the failure.).

Regarding claim 36, Beck teaches the method of claim 35, wherein the identifying is performed by the first virtual network device sub-unit within the virtual network device (Paragraph [0011], When a link has failed, the address of the processor node is acquired by another processor node for the duration of the failure.).

Regarding claim 37, Beck teaches the method of claim 29, further comprising: communicating packets between the first virtual network device sub-unit and the second virtual network device sub-unit via a virtual network device link (Paragraph [0027], Processor nodes distribute packets within the cluster.).

Regarding claims 38, 48, and 58 Beck teaches a method, system, and a computer readable medium comprising: sending a first packet via a first link of a virtual link bundle if a destination identifier associated with the first packet identifies the virtual link bundle; and sending a second packet via a second link of the virtual link bundle if a destination identifier associated with the second packet identifies the virtual link bundle (Paragraph [0009], When a receiving node determines which processor node to send to, it broadcasts the data packet over the network for delivery to the processor node.), wherein the first link is coupled to a first virtual network device sub-unit, and the second link is coupled to a second virtual network device sub-unit (Fig. 2 discloses a cluster containing processor nodes B (first virtual network sub-unit) and C (second virtual network device sub-unit) which are connected via links associated with the subnet depicted in Fig. 2.).

Regarding claims 40, 50, and 60 Beck teaches the method of claim 39, the system of claim 49, and the computer readable medium of claim 59 further comprising: appending a header to the first packet (Paragraph [0009], The data packet's header is modified before it is delivered across the network to the processor node (i.e. via the first link).), wherein the header identifies which port of a plurality of ports received the first packet (Paragraph [0030], The TCP/IP header identifies the source node, the destination node, the sending port, the destination port, and the protocol being used.), and the sending the first packet via the first link comprises sending the header via the first link.

Regarding claims 41, 51, and 61 Beck teaches a method, system, and the computer readable medium comprising: receiving a packet, wherein a destination identifier for the packet identifies an interface bundle (Paragraph [0004], Cluster alias addresses are used to make the cluster appear to be a single node.), and the interface bundle comprises a first interface (Fig. 2 discloses a cluster comprising processor nodes, each with a processor interface. The processor interface of processor node B is the first interface.); and filtering the packet from a packet flow being sent via the first interface if the packet was received via a virtual network device link (Paragraph [0009], When a receiving node determines which processor node to send to, it broadcasts the data packet over the network for delivery to the processor node.).

Regarding claims 42, 52, and 62 Beck teaches the method of claim 41, the system of claim 51, and the computer readable medium of claim 61 further comprising: sending the packet via the first interface if the packet was not received via the virtual network device link (Paragraph [0058], Nodes forward packets to each other via the cluster interconnect.).

Regarding claims 43, 53, and 63 Beck teaches the method of claim 42, the system of claim 52, and the computer readable medium of claim 62 further comprising: maintaining consistency between a lookup table comprised in a first virtual network device sub-unit and a second lookup table comprised in a second virtual network

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device sub-unit (Paragraph [0076], Each processor node within the cluster establishes a database containing the network layer address used by each of the processor nodes in the cluster.).

Regarding claims 44, 54, and 64 Beck teaches the method of claim 42, the system of claim 52, and the computer readable medium of claim 62 further comprising performing control protocol processing for the interface bundle at a primary controller comprised in a first virtual network device sub-unit (Paragraph [0007], Nodes distribute TCP packets to other processing nodes for servicing.), wherein the first interface is comprised in the first virtual network device sub-unit (Fig. 2 discloses a cluster comprised of nodes (i.e. first virtual network device sub-unit) each of which has a processor interface.).

Regarding claims 45, 55, and 65 Beck teaches the method of claim 44, the system of claim 54, and the computer readable medium of claim 64 further comprising: managing a second interface of the second virtual network device sub-unit in response to information generated by the performing the control protocol processing (Paragraph [0055], The Mbuf chain is queued for service of packets on the second node.), wherein the second interface is comprised in the interface bundle (Fig. 2 discloses a cluster (i.e. interface bundle) comprising processor node C with processor interface 20c.).

Regarding claims 46, 56, and 66 Beck teaches the method of claim 45, the system of claim 55, and the computer readable medium of claim 65 further comprising: looking up a destination address of a second packet in a lookup table (Paragraph [0030-0036], The TCP/IP header identifies the source node, the destination node, the sending port, the destination port, and the protocol being used. TCP port numbers are used to designate queues into which arriving packets are placed for service by nodes. Paragraph [0076], Each processor node has a database containing the network layer addresses used by each processor in order to take over in case of a failure.), and if the lookup table returns the destination identifier, sending the sending packet via the first interface of the first virtual network device sub-unit instead of sending the packet via the second interface of the second virtual network device sub-unit (Paragraph [0076], If a processor node crashes, another takes over for it.).

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Regarding claim 47, Beck teaches the method of claim 41, further comprising: learning that a source address of the packet is behind a local interface, in response to receiving the packet via the virtual network device link (Paragraph [0009], The packet is broadcasted from one node to another over the network.).

Regarding claim 57, Beck teaches the system of claim 51, further comprising: means for learning that a source address of the packet is behind a local interface, in response to receiving the packet via the virtual network device link (Paragraph [0009], The packet is broadcasted from one node to another over the network.).

Regarding claim 67, Beck teaches the computer readable medium of claim 61, wherein the program instructions are further executable to: learn that a source address of the packet is behind a local interface, in response to detecting reception of the packet via the virtual network device link (Paragraph [0009], The packet is broadcasted from one node to another over the network.).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 21, 32, 39, 49, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beck in view of U.S. 6,735,205 to Mankude et al (hereinafter Mankude).

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Regarding claim 21, Beck teaches the system of claim 20, Beck does not teach but Mankude teaches wherein the network device is configured to use a hash-based load-sharing algorithm to select one of a plurality of communication links comprised in the virtual link bundle (Mankude, Col. 7, line 10-25, In order to select a server node to forward the packet to, the system hashes the source address of the client. The hashing selects an entry to identify a server node within a clustered computing system.), and Beck teaches the network device is configured to send a packet via the selected one of the communication links (Beck, Paragraph [0027], Nodes distribute packets to other nodes within the cluster.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine teaches wherein the network device is configured to use a hash-based load-sharing algorithm to select one of a plurality of communication links comprised in the virtual link bundle as taught by Mankude with the system of Beck in order to select a server node to forward a packet to (Mankude, Col. 7, line 10-25).

Regarding claim 32, Beck teaches the method of claim 31, Beck does not teach but Mankude teaches wherein the selecting is performed using a hash-based algorithm (Mankude, Col. 7, line 10-25, In order to select a server node to forward the packet to, the system hashes the source address of the client. The hashing selects an entry to identify a server node within a clustered computing system.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine teaches wherein the selecting is performed using a hash-based algorithm as taught by Mankude with the system of Beck in order to select a server node to forward a packet to (Mankude, Col. 7, line 10-25).

Regarding claims 39, 49, and 59, Beck teaches the method of claim 38, the system of claim 48, and the computer readable medium of claim 58 further comprising: selecting the first link from a plurality of links comprised in the virtual link bundle (Paragraph [0009], When a receiving node determines which processor node to send to, it broadcasts the data packet over the network for delivery to the processor node.), Beck does not teach but Mankude teaches wherein the selecting comprises performing a hash-based algorithm (Mankude, Col. 7, line 10-25, In order to select a server node to forward the packet to, the system hashes the source address of the client. The hashing selects an entry to identify a server node within a clustered computing system.).

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Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine wherein the selecting comprises performing a hash-based algorithm as taught by Mankude with the system of Beck in order to select a server node to forward a packet to (Mankude, Col. 7, line 10-25).

Response to Arguments

3. Applicant's arguments filed 04/07/2008 have been fully considered but they are not persuasive.

Applicant argues that Beck fails to teach a virtual link bundle that includes communication links that are configured to be coupled to a sub-unit of a virtual network device on one end and a network device on the other. The examiner respectfully disagrees. Beck discloses these limitations in fig. 2. Fig. 2 shows a virtual network device (i.e. a cluster) comprising several sub-units (i.e. the processor nodes). The cluster is a grouping of processor nodes (see paragraph [0027]) which functions a virtual network device comprising several sub-units. In this case the sub-units are the processor nodes.

Applicant argues that Beck fails to teach a network device configured to append a header to a packet before sending the packet to the virtual network device via one of the communication links, the header identifies one of the ports having received the packet. The examiner respectfully disagrees. Paragraph [0009] of Beck discloses modifying (i.e. appending) a header with information and directing the packet to the destination processor node.

Applicant argues that Beck fails to teach a first interface, which is part of a first virtual network device sub-unit, and a second interface, which is part of a second virtual network device sub-unit, which are both assigned the same logical identifier. The examiner respectfully disagrees. Paragraph [0027] of Beck discloses that the cluster is assigned one address. The different interfaces of the processor nodes are associated with this address (Beck, [0027]).

Applicant argues that Beck fails to teach a controller that is part of a virtual network device sub-unit and configured to perform control processing for a first interface according to a routing protocol running on the interface bundle. The examiner respectfully disagrees. Paragraph [0076] of Beck discloses this control processing as each processor within the cluster establishes a database. The database contains the network layer addresses used by each of the processor nodes in the cluster. The network layer addresses represent routing protocol since the addresses

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represent destinations where data is routed. Therefore establishing databases containing the network layer addresses well represents the control processing according to a routing protocol.

Applicant argues that Beck fails to teach filtering a packet from a packet flow being sent via the first interface if the packet was received via a virtual network device link. The examiner respectfully disagrees. Beck discloses in paragraph [0009] filtering a packet from a packet flow being sent via the first interface if the packet was received via a virtual network device link. A processor node receives a packet (i.e. via a virtual network device link, see fig. 2) and decides where to send it. In this way the packet is filtered.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN J. JAKOVAC whose telephone number is (571)270-5003. The examiner can normally be reached on Monday through Friday, 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason D. Cardone can be reached on (571) 272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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RJ

/Jason D Cardone/
Supervisory Patent Examiner, Art Unit 2145